



Effect on rice cultivars (*Oryza sativa* cv. FR13A, IR42, Rashpanjor, Pokkali)

The net impact of individual and combined stress on plant growth

Crop: Rice (*Oryza sativa* cv. FR13A, IR42, Rashpanjor, Pokkali)
 Stress 1: Salinity (12 dSm⁻¹)
 Stress 2: Submergence (7 days)
 Stage of plant : 5 day after germination

The table shows the effect of submergence and salt alone and in combination on growth and physiology of rice plants.

	Treatment	Plant response to stress	Plant response to stress
		Type A parameters*	(reduction over control %) Type B parameters*
		Survival (%)	Chlorophyll content
FR13A	Salinity (12 dSm ⁻¹)	100.00	37.8↓
	Submergence	100.00	24.3↓
	Salt (12 dSm ⁻¹) + Submergence (Simultaneous stress)	100.00	45.9↓
IR42	Salinity (12 dSm ⁻¹)	99.60	40.0↓
	Submergence	23.20	54.3↓
	Salt (12 dSm ⁻¹) + Submergence (Simultaneous stress)	0.00	74.3↓
Rashpanjor	Salinity (12 dSm ⁻¹)	99.60	NA
	Submergence	27.00	NA
	Salt (12 dSm ⁻¹) + Submergence (Simultaneous stress)	0.00	NA

AC39416	Salinity (12 dSm-1)	99.60	2.9↓
	Submergence	99.60	35.3↓
	Salt (12 dSm-1) + Submergence (Simultaneous stress)	41.60	50.0↓

Reference – Sarkar RK, Ray A (2016) Submergence-tolerant rice withstands complete submergence even in saline water: Probing through chlorophyll a fluorescence induction O-J-I-P transients. *Photosynthetica* 54: 275–287.

Note: *Values presented in the table were calculated using the formula described below.*

$$\text{Reduction over control (\%)} = \frac{(\text{Value Control} - \text{Value Stress})}{\text{Value Control}} \times 100$$

‘↓’- indicates plant parameters affected by stress that lead to high susceptibility (higher the value more the damage).

‘*’ - For more information on parameter classification, please refer to the ‘methodology’ tab.

Inference from the study: Sarkar 2016, studied the interaction of submergence and salinity in four rice cultivars. Plants were subjected to single and simultaneous salt and submergence stress treatment. Chlorophyll content was reduced synergistically under combined stress compared to individual stress in all cultivars. Survival percentage was also reduced by combined stress conditions in cultivars IR42, Rashpanjor and AC39416. **Thus, this stress combination is detrimental to the growth and survival of rice cultivars.**